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Low-emission aviation development for sustainable air transport*

Lo sviluppo di un'aviazione a basse emissioni al fine di ridurre l'impatto ambientale del trasporto aereo

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***Abstract* [ENG]**: The article examines the legislative provisions related to air transport on the uptake and supply of sustainable aviation fuels together with the legal framework at European and national level on the promotion of the use of energy from renewable sources regarding transport sector. What is laid down on the development and production of sustainable aviation fuels should comply with the sustainability and lifecycle emissions criteria referred to in the European legislation in order to ensure consistency. Furthermore, the financial support schemes put in place by the EU legislation for the use of energy from renewable sources in aviation are examined.

***Abstract* [ITA]**: L'articolo esamina le disposizioni legislative relative al trasporto aereo in materia di adozione e fornitura di carburanti sostenibili per l'aviazione, nonché il quadro giuridico a livello europeo e nazionale sulla promozione del l'uso di energia da fonti rinnovabili nel settore dei trasporti. Le disposizioni relative allo sviluppo e alla produzione di carburanti per l'aviazione sostenibili dovrebbero essere conformi ai criteri di sostenibilità e di emissioni nel corso del ciclo di vita indicati nella legislazione europea, al fine di garantire la coerenza. Inoltre, vengono esaminati i regimi di sostegno finanziario istituiti dalla legislazione UE per l'uso del l'energia da fonti rinnovabili nel settore del l'aviazione.

SUMMARY: **1.** The Regulation ReFuelEU Aviation for sustainable air transport. – **2.** The EU legislative framework on the support programmes for the use of sustainable fuels in aviation. – **3.** The development and production of sustainable fuels in air transport.

Keywords: transports – aviation – sustainability
Parole chiave: trasporti – aviazione – sostenibilità

1. The Regulation ReFuelEU Aviation for sustainable air transport.

ReFuelEU Aviation Regulation (UE) 2023/2405[1] of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport embraces the legislative provisions related to air transport and it applies to the "aircraft operators" that operate commercial air transport flights departing from Union airports, to "Union airports" and to the "Union airport managing body" in respect to that airports (Articles 2 & 3)[2].

Regulation *ReFuelEU Aviation* (UE) 2023/2405 comprises provisions that require Member States to accelerate on the supply and uptake of sustainable fuels for aviation and acts in line with the Directive (UE) 2018/2001[3] (RED II) of the European Parliament and of the Council of 11 December

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[1] Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation).

[2] See also: B. MAYER, Z. DING, *Climate Change Mitigation in the Aviation Sector: A Critical Overview of National and International Initiatives*, in *Transnational Environmental Law*, n. 12:1, 2023, 14-41; C. WILSON, *Reaching net zero – the aviation sector*, in *Company Secretary's Review*, Volume 46, Issue 3, 2022, 43.

[3] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the

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2018 on the promotion of the use of energy from renewable sources (recast) on renewable energy sector. Furthermore, it outlines the measures that should be adopted in order the climate objectives established by Regulation (UE) 2021/1119[4], also known as the "European Climate Law", are achieved in the European Union.

Aviation fuel suppliers[5] shall guarantee that the minimum shares of sustainable aviation fuels (SAF) including synthetic aviation fuels are made available to aircraft operators at each Union airport. According to *ReFuelEU Aviation* Regulation the share of SAF mixed with the conventional aviation fuel provided at EU airports should gradually increase starting with a minimum share of 2% of SAF in EU airports from 1st January 2025 with the aim to reach the 70% in 2050[6].

Article 6 of Regulation (UE) 2023/2405 *ReFuelEU Aviation* on the access of aircraft operators to aviation fuels containing minimum shares of SAF provides an obligation on the Union airport managing bodies to assist and make possible the access to aviation fuels in accordance with the provisions of the Regulation. Furthermore, it ensures that minimum shares of sustainable aviation fuels shall be secured in the same way in all Union airports in order to guarantee equal access options regarding SAF to all aircraft operators although autonomy is recognised by the Regulation on achieving greater results than the minimum shares required therein on the uptake and supply of sustainable aviation fuels.

Starting from 2025 and by 14th February of each reporting year (Article 10 of Reg. (UE) 2023/2405) aviation fuel suppliers should state, in the Union database referred to in Article 31a of Directive (EU) 2018/2001 (RED II), the information regarding the amount of sustainable aviation fuel supplied at each Union airport, the conversion process as well as the origin of the raw material deployed for SAF production[7]. Fuel suppliers shall ensure the accuracy of the information submitted to the Union database so transparency is secured[8]. To that purpose, Article 12, n. 6, of the *ReFuelEU Aviation* Regulation, establishes liability, subject to a fine, to any aviation fuel supplier, air operator and Union airport managing body that has been proven to provide misleading or inaccurate information regarding the characteristics or the origin of the SAF that it supplied[9]. The Regulation requires from Member States to certify the fulfilment of the obligations with efficient mechanisms put in place at national level[10] in order to combat fraudulent acts.

ReFuelEU Aviation Regulation[11] entails the cooperation between the Union airport managing bodies, aviation fuel suppliers and handlers and their respective Member State in order to plan by the end of 2025 the national policy frameworks for the deployment of alternative fuels infrastructure in

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use of energy from renewable sources (recast).

[4] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ("European Climate Law").

[5] Article 4 of Regulation (UE) 2023/2405.

[6] See Special Report ENAC (Italian Civil Aviation Authority), Building the roadmap for the sustainable aviation Fuels in Italy, Summary of the path undertaken by Enac for the definition of the SAF policy, 2023, 1-7; Special Report of European Court of Auditors: The EU's support for sustainable biofuels in transport https://www.eca.europa.eu/ECAPublications/SR-2023-29/SR-2023-29_EN.pdf Also: CAZZOLA P. ET AL., *Research for TRAN Committee: Assessment of the potential of sustainable fuels in transport*, European Parliament, 2023, 58.

[7] See: EU Focus, *New transport proposals target greater efficiency and more sustainable travel*, 411, 2022, 43-44; B. MAYER, Z. DING, op. cit.; C. WILSON, op. cit.

[8] Rec. 24 Regulation ReFuelEU Aviation.

[9] Art. 12 Regulation ReFuelEU Aviation.

[10] Special Report of European Court of Auditors: The EU's support for sustainable biofuels in transport https://www.eca.europa.eu/ECAPublications/SR-2023-29/SR-2023-29_EN.pdf; MCKINSEY & COMPANY, How the European Union could achieve net-zero emissions at netzero cost, 2020, https://www.mckinsey.com/capabilities/sustainability/our-insights/how-the-european-union-could-achieve-net-zero-emissions-at-net-zero-cost

[11] Article 7 of ReFuelEU Aviation Regulation.

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airports falling within the scope of Regulation (AFIR) (EU) 2023/1804[12] of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure.

AFIR (*Alternative Fuels Infrastructure Regulation*) (UE) 2023/1804, in force since 13th April 2024, sets the national objectives for the implementation and use of an efficient alternative fuels infrastructure in the European Union with the aim to support interoperability[13] among the different modes of transport (art. 14). Regulation's objectives should guarantee travel and transport throughout EU without interruptions with publicly available electric recharging infrastructure and with publicly accessible hydrogen refuelling stations across all transport modes in the UE while electricity supply should be established in the airports of the trans-European transport network (TEN-T)[14] with access to electricity supply for stationary aircrafts[15]. Article 4 states the overall objective of the development of the trans-European transport network which is *to establish a single multimodal Union wide transport network of high quality.* Also, Article 2 establishes that the infrastructure of the trans-European transport network *consists of the infrastructure for railway transport, inland waterway transport, maritime transport, road transport, air transport and multimodal transport, including in urban nodes.*

With regard to the electricity supply in airports AFIR Regulation (EU) 2023/1804 compels an external electricity supply to be provided while aircraft are parked at the aircraft contact stands or aircraft remote stands at airports of the TEN-T network. The use of an external electricity supply should replace the use of the engines when aircraft are stationary at airports in a way that pollutant and noise emissions are reduced, air quality is improved whilst is diminished the overall negative impact on climate change.

However, Regulation excludes the airports of the TEN-T network with less than 10 000 commercial flight movements per year from the obligation to provide electricity to stationary aircraft at all remote stands. It also compels Member States to link the major airports with rail transport in order to improve interoperability and to make competitive rail transport to national flights[16].

2. The EU legislative framework on the support programmes for the use of sustainable fuels in the transport sector.

Directive (EU) 2018/2001 [RED II] of 11 December 2018 (recast) which came into effect on 1st July 2021 amending Directive 2009/28/EC, instead of a national framework in financial support schemes launched previously by Directive 2009/28/EC (RED I) of 23 April 2009[17] moved towards an EU legislative context with eligibility criteria. In Article 29, par. 1, it is, in fact, specifying that energy from biofuels, bioliquids and biomass fuels in order to be eligible for receiving financial

[12] Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU.

[13] H. K. JESWANI ET AL., *Environmental sustainability of biofuels: a review*, in *Proceedings of the Royal Society A*, Volume 476, Issue 2243, 2020, 3. See also CAZZOLA P. ET AL., op. cit.; M. N. FANG, *When Decarbonization Meets Industrialization: The First WTO Dispute between the EU and UK*, (January 18, 2023), in *City University of Hong Kong School of Law Legal Studies Research Paper, Virginia Journal of International Law*, Volume 63, n. 2, 2023, 1-42; B. MAYER, Z. DING, op. cit.

[14] Regulation (EU) 2024/1679 of the European Parliament and of the Council of 13 June 2024 on Union guidelines for the development of the trans-European transport network, amending Regulations (EU) 2021/1153 and (EU) No 913/2010 and repealing Regulation (EU) No 1315/2013, PE/56/2024/ADD/1.

[15] Key "Fit for 55" legislation adopted (Legislative Comment) EU Focus 2023, 433, 11-12.

[16] Special report, European Court of Auditors, Intermodal freight transport EU still far from getting freight off the road, 2023. https://www.eca.europa.eu/lists/ecadocuments/sr-2023-08/sr-2023-08_en.pdf

[17] Directive 2009/28/EC [RED I] of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of biofuels and other renewable and sustainable fuels was asserting for the proper functioning of national support schemes as Member States can control the effect and costs of their national aid programmes according to their different potentials whilst maintain investor confidence.

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support should fulfil the criteria laid down therein and in particular it should comply with the sustainability and greenhouse gas emissions saving criteria accordingly with the provisions of the Directive[18].

Biofuels are renewable alternatives to fossil fuels and consistent with the definition provided in Article 2, par. 2, (33) of Directive (EU) 2018/2001 [Renewable Energy Directive -RED II] biofuels, are "liquid fuels for transport produced from biomass". In the same article 2, par. 2, (24) is identified the term "biomass" as renewable organic material that originates from agricultural, aquaculture, fisheries and forestry residues. The ultimate goal of the use of biofuels in the transport sector is to reduce greenhouse gas (GHG) and achieve EU's climate neutrality objectives.

UE legislation compels for uniformity and transparency on the certification of the raw materials used. Certificates shall include all the information, provided by the relevant economic operators, on the quantities, geographic origin and feedstock type of biofuels, bioliquids and biomass fuels[19]. This policy intends to promote antifraud mechanisms and to prevent counterfeit operations in the supply chains for bioenergy and recycled carbon fuels.

On 15 January 2024 became operational the "Union database" introduced by Directive (EU) 2018/2001 (RED II) with the aim to enable the tracing of liquid and gaseous renewable fuels and recycled carbon fuels and, therefore, prevent fraud in production pathway of bioenergy and recycled carbon fuels[20]. The "Union database" addresses concerns on fraud and it provides comprehensive monitoring of the production of sustainable fuels in terms of transparency, traceability and supervision[21].

The revision of the EU legislation by the European Commission, brought to important amendments regarding the support schemes for the production of renewable and sustainable fuels.

The third Renewable Energy Directive (RED III) (UE) 2023/2413 of the European Parliament and of the Council of 18 October 2023, with effect since 20 November 2023, sets up measures regarding the biomass harvesting and collection, which shall ensure that energy from biomass is produced in a way that minimises undue distortive effects on the biomass raw material market and reduces any risk of adverse impact on biodiversity, the environment and the climate[22].

To avoid incentives to non-sustainable models Directive (UE) 2023/2413 (RED III) has introduced a series of restrictions regarding subsidies and financial support schemes. According to the provisions of the Directive, Member States should not grant direct financial support (except tax benefits which are not considered to be direct financial support) for the production of energy from saw logs, veneer logs, industrial grade roundwood, stumps and roots.

Furthermore, Member States should not grant new support or renew any financial support for electricity-only plants, unless the installations are located in regions with a specific use status as

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[18] H. SCHEUING, J. KAMM, *The EU on the road to climate neutrality – is the 'Fit for 55' package fit for purpose?*, in *Renewable Energy Law and Policy Review*, Volume 10, Issue 3-4, 2022, 4–18; J. WELLER, *Update of the REPowerEU plan and "Fit for 55" package*, in *International Energy Law Review*, Volume 6, 2023, 196-199; A. METAXAS, *On the way to EU's clean energy transition: new approaches and challenges for Gas Regulation in the EU*, in *Journal of World Energy Law & Business*, Volume 17, Issue 1, 2024, 69-86.

[19] See also MCKINSEY & COMPANY, op. cit.; EU Focus, *New proposals to support clean and modern shipping*, 429, 2023, 40-42; H. K. JESWANI ET AL., op. cit.

[20] According to Directive (EU) 2023/2413 relevant economic operators shall declare in the 'Union database' all the information related to whether financial support has been provided for the production of a specific consignment of fuel, and if so, specify the type of support scheme.

[21] Art. 31*bis*, Directive (EU) 2023/2413: the data may be entered into the Union database via national databases which can be used by economic operators as a tool for collecting and declaring data and for transferring them into the Union database.

[22] European Court of Auditors Special Report Sustainable finance: More consistent EU action needed to redirect finance towards sustainable investment, September 2021. https://www.eca.europa.eu/Lists/ECADocuments/SR21_22/SR_sustainable-finance_EN.pdf; MCKINSEY & COMPANY, op. cit. See also A. L. BOVENBERG, L. H. GOULDER, *Environmental Taxation and Regulation*, in *Handbook of Public Economics*, Volume 3, 2002, 1471-1545.

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regards their transition away from fossil fuels[23].

In this legislative context is encouraged the introduction of specific incentives, involving the development and use of innovative and sustainable technologies, essential for the implementation of renewable fuels of non-biological origin (RFNBOs). The production of RFNBOs are much higher than the production of non-renewable fuels[24] and financial support schemes are crucial and necessary.

Directive RED III (EU) 2023/2413[25] emphasizes that renewable fuels of non-biological origin (RFNBOs) and renewable hydrogen, present a great potential to satisfy the needs of the decarbonisation process as they can be used as a raw material or energy source in aviation together with other renewable fuels of the same scale.

For the above considerations, European Union in order to give financial assistance to Member States and especially to regions that lack adequate and efficient national support schemes for the green transition process, has adopted Regulation (EU) 2021/1056[26], in force since 1st July 2021, which establishes the Just Transition Fund.

Just Transition Fund (JTF) aims to provide support to people, economies and environment of territories experiencing severe social and economic hardship, and struggling with problems deriving from the green transition. In Article 2 communicates the specific objective of the JTF, which is to assist regions and people to address the social, employment, economic and environmental impacts of the transition, in line also with principles and strategic objectives established with the Fund Package set up by Regulation EU 2021/1060[27].

Regulation (EU) 2021/1056 introduces incentives by giving full access to JTF resources to Member States with concrete and tangible results on achieving the EU transition targets whilst access to the JTF should be limited to 50 % of the national allocation for those Member States that have not yet succeeded to implement the objective, with the other 50% being made available for programming upon acceptance of such a commitment.

Article 5 introduces the Green Rewarding Mechanism with distribution of the additional resources among Member States that have achieved a reduction in greenhouse gas emissions. In the transport sector the Just Transition Fund promotes eco-friendly and intelligent local transport and encourages sustainable urban mobility solutions by supporting investments, integrating sustainable transportation solutions and infrastructure improvements.

Moreover, investments for sustainable transport infrastructures, are covered by Regulation (EU) 2021/523, establishing the InvestEU Programme[28]. The InvestEU Programme prioritises areas that are under-invested and additional investment are required and it works in synergy with other relevant Union programmes in the transport sector and energy[29].

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[23] Following its entry into force the Directive RED III [(EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023] Art. 2, par. 2, f), (22a) has been amended in a way that now includes the definition of "renewable fuels" meaning biofuels, bioliquids, biomass fuels and renewable fuels of non-biological origin where "renewable fuels of non-biological origin" means liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass.

[24] See B. MAYER, Z. DING, op. cit.; C. WILSON, op. cit.

[25] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652.

[26] Regulation (EU) 2021/1056 of the European Parliament and of the Council of 24 June 2021 establishing the Just Transition Fund.

[27] Regulation (EU) 2021/1060 of the European Parliament and of the Council of 24 June 2021 laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, the Just Transition Fund and the European Maritime, Fisheries and Aquaculture Fund and financial rules for those and for the Asylum, Migration and Integration Fund, the Internal Security Fund and the Instrument for Financial Support for Border Management and Visa Policy.

[28] Regulation (EU) 2021/523 of the European Parliament and of the Council of 24 March 2021, establishing the InvestEU Programme and amending Regulation (EU) 2015/1017.

[29] Regulation (EU) 2021/523 covers investments in sustainable transport infrastructures, particularly maritime

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3. The development and production of sustainable fuels in the air transport.

To incentivise within the Union market, the development of sustainable aviation fuels and the transition from fossil kerosene to sustainable aviation fuels which entails significant price differential, ReFuelEU Regulation on the obligation placed upon aviation fuel suppliers to use more sustainable fuels, recognizes a reward related to sustainability.

More particularly, Directive ETS (UE) 2023/959 (*Emission Trading System*) as amended by Directive (EU) 2023/958[30] of the European Parliament and of the Council of 10 May 2023, introduces an incentive to the early movers consisting in twenty (20) million allowances for the period from 1 January 2024 until 31 December 2030 to be allocated to cover part of the remaining price differential between fossil kerosene and the eligible aviation fuels for individual aircraft operators[31].

Sustainable aviation fuels (SAF)[32] are either synthetic aviation fuels, aviation biofuels (different from biofuels produced from food and feed crops) or recycled carbon aviation fuels and represent the most effective solution for GHG reduction in short term period[33].

What is laid down in the reg. (UE) 2023/2405 *ReFuel Aviation* on the deployment of sustainable aviation fuels should comply with the sustainability and lifecycle emissions criteria formulated with the Renewable Energy Directive – RED II (EU) 2018/2001[34] on the promotion of the use of energy from renewable sources in order to ensure consistency among the European legislative acts[35]. The sustainability criteria concern the origin of the raw materials with all the information related to the quantities, geographic origin and feedstock type of biofuels. Renewable hydrogen for aviation and low-carbon aviation fuels achieving at least same level of lifecycle emissions savings as synthetic aviation fuels are also included as they can replace conventional aviation fuels[36].

In Italy, the legislative decree n. 199 of 8 November 2021[37], incorporated Directive (UE) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources laying down the sustainability and lifecycle emissions criteria for biofuels, bioliquids and fuels deriving from biomass. Recently entered into force the I*nterministerial Decree 7 August 2024 with which is established a national certification system*

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infrastructures and multimodal transport hubs. With regard to maritime sector InvestEU Programme contributes to Union policies concerning seas and oceans through the development of projects and enterprises in the blue economy, focusing on investments in maritime entrepreneurship and industry for innovative and competitive maritime sector whilst promotes renewable marine energy.

[30] Directive (EU) 2023/958 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC as regards aviation's contribution to the Union's economy-wide emission reduction target and the appropriate implementation of a global market-based measure.

[31] Art. 1, 2) b) n. 6 of Directive (UE) 2023/958.

[32] Article 3, n. 7 of Reg. (UE) 2023/2405 *ReFuel Aviation.*

[33] See Special Report ENAC (Italian Civil Aviation Authority), Building the roadmap for the sustainable aviation Fuels in Italy, Summary of the path undertaken by Enac for the definition of the SAF policy, 2023, pp. 1-7.; Special Report of European Court of Auditors: The EU's support for sustainable biofuels in transport https://www.eca.europa.eu/ECAPublications/SR-2023-29/SR-2023-29_EN.pdf. See also: CAZZOLA P. ET AL, op. cit.; B. MAYER, Z. DING, op. cit.; C. WILSON, op. cit.

[34] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast).

[35]See AESA, European Aviation Environmental Report 2022, 2023. 12 Study supporting the impact assessment of the ReFuelEU Aviation initiative, 2021.

[36] Aviation ReFuelEU Aviation Regulation establishes that aviation fuel suppliers will have to blend sustainable aviation fuels with conventional fuels, starting with a 2 % minimum blend in 2025 and reaching 70 % in 2050. From 2030, 1.2 % of fuels must also be synthetic fuels, rising to 35 % in 2050. Sustainable aviation fuels include, for example, electric fuels produced from renewable hydrogen. See B. MAYER, Z. DING, op. cit.; C. WILSON, op. cit.

[37] Legislative decree 8 November 2021, n. 199, which adopted Directive (UE) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources entered into force on 15 December 2021.

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ensuring compliance to sustainability criteria referred to in the legislative decree n. 199/2021 embracing for the first time renewable fuels of non-biological origin and recycled carbon fuels[38].

With regard to sustainability criteria linked to food and feed crops-based biofuels, although the demand for these biofuels is minor in the air transport sector since the majority of the aviation fuels at present are of fossil origin is essential to maintain the same course of action in all modes of the transport sector and therefore exclude feed and food crop-based fuels[39].

On the emissions in the air transport sector and on what SAF could represent in their reduction in the short to medium term, ENAC (Italian Civil Aviation Authority)[40] affirms that has to be promoted and encouraged a national SAF production, in line with the international experience, mainly derived from biomass[41]. The raw material should not be limited to waste substances but be extended also to biomass derived from land which, in any case, does not trigger demand for additional land and is non used for agricultural purposes taking into account the Union sustainability criteria, and the need to limit food and feed crops-based biofuels in line with Directive (UE) 2018/2001 (RED II)[42].

This policy would bring immediate benefits to air transport sector by allowing the least developed Countries to enter in the production of sustainable aviation fuels. Likewise International Civil Aviation Organization (ICAO)[43] with the programme "*Assistance Capacity-building and Training for SAF* (ACT-SAF)" gives support and assistance to States and Organizations in various stages of SAF development and deployment.

To benefit from the support schemes on the use of renewable fuels of non-biological origin in aviation, in line with the broader EU legislative framework on the incentives and financial support schemes for the development of alternative renewable fuels in the transport sector, is essential the sustainability criteria, greenhouse gas emissions saving criteria and thresholds provided by Directive (UE) 2018/2001 (RED II) being fulfilled.

According to Article 2, e) of Legislative decree n. 199/2001 which incorporated Directive (UE) 2018/2001 (RED II) on the promotion of the use of energy from renewable sources, the devices available for the promotion of the use of energy from renewable sources[44] include «*investment support, tax exemptions or reliefs, tax refund, direct support schemes on prices etc.*» Support schemes are covered by Title II of the Legislative decree n. 199/2001 and acts together with other instruments such as Italy's *Recovery and Resilience Plan*[45]. According to Art. 4, par. 2 support schemes should

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[38] On sustainability in the transport sector see: L. AMMANNATI, *Diritto alla mobilità e trasporto sostenibile. Intermodalità e digitalizzazione nel quadro di una politica comune dei trasporti*, in *Federalismi.it*, 4, 2018; P. CAZZOLA ET AL., op. cit.

[39] J. GLAUBER, C. HEBEBRAND, *Food versus Fuel v 2.0: Biofuel policies and the current food crisis*, *International Food Policy Research Institute*, 2023, https://www.ifpri.org/blog/food-versus-fuel-v20-biofuel-policies-and-current-food-crisis/

[40] See Special Report ENAC (Italian Civil Aviation Authority), Building the roadmap for the sustainable aviation Fuels in Italy, Summary of the path undertaken by Enac for the definition of the SAF policy, 2023, pp. 1-7.

[41] A. SAVARESI, L. PERUGINI, *Balancing Emissions and Removals in the Land Sector: The View from the EU*, in *Carbon & Climate Law Review*, Volume 15, Issue 1, 2021, 49-59; H. K. JESWANI, op. cit.; A. SWINBANK, *The WTO's Agreement on Agriculture: Where Next?*, in *Trade, Law and Development*, Volume 14, n. 1, 2022, 1-52.

[42] Renewable Energy Directive 2018/2001/EC, Art. 2, § 2, n. 40: "food and feed crops" means starch-rich crops, sugar crops or oil crops produced on agricultural land as a main crop excluding residues, waste or ligno-cellulosic material and intermediate crops, such as catch crops and cover crops, provided that the use of such intermediate crops does not trigger demand for additional land.

[43] On 1 June 2022, the "ICAO Assistance, Capacity-building and Training for Sustainable Aviation Fuels (ACT-SAF) programme" was officially launched as a side event officially associated to Stockholm+50 to showcase ICAO's achievements and further efforts for decarbonizing aviation by creating creates opportunities for States to develop their full potential in SAF development and deployment. See: https://www.icao.int/environmental-protection/Pages/act-saf.aspx

[44] See F. VETRÒ, *Sviluppo sostenibile, transizione energetica e neutralità climatica, profili di governance: efficienza energetica ed energie rinnovabili nel "nuovo ordinamento" dell'energia*, in *Rivista Italiana di Diritto Pubblico Comunitario*, n. 1, 2022, 53.

[45] Art. 4, par. 1, of Legislative decree n. 199/2001.

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respect specific criteria and act in compliance with EU legislation on State Aids[46].

Title V deals with energy in the transport sector from renewable sources and with sustainability criteria concerning biofuels, bioliquids and fuels deriving from biomass whilst in Annex V are listed the raw materials used for the production of biogas for transport sector and advanced biofuels. Soon after, has been adopted the so-called 'Biofuels Decree' n. 107/2023[47] of the Minister of Environment and Energy Security concerning "Conditions, criteria, and methods for implementing the obligation of use energy from renewable sources in transport, among the different types of biofuels, including advanced ones, renewable energy carriers of biological origin, Renewable Fuels of Non-Biological Origin/RFNBOs, and Recycled Carbon Fuels (RCFs)" with new provisions on the use of energy from renewable sources in the transport sector.

Recently, the European Commission has revised the legislation with the adoption of Directive (UE) 2023/2413[48] (Renewable Energy Directive – RED III) of the European Parliament and of the Council of 18 October 2023 in force since 20 November 2023 amending Directive (EU) 2018/2001 introducing adjustments regarding support schemes on the use of sustainable fuels.

So as to the objective to achieve decarbonisation, RED III Directive (article 25) establishes that Member States shall increase renewable energy and reduce greenhouse gas intensity in the transport sector and shall set an obligation on fuel suppliers to ensure that the combined share of advanced biofuels, biogas and renewable fuels of non-biological origin (such as hydrogen from renewable sources and synthetic fuels) in the energy supplied to the transport sector is at least 1 % in 2025 and is 5,5 % in 2030[49] (by placing a new target from 3,5% that was established in Directive RED II to 5,5 % in 2030 of which a share of at least 1 percentage point is from renewable fuels of non-biological origin (RFNBO).

The RED III measures should be implemented with investments in renewable energy technologies only. The financial support should enhance the use of renewable energy usage in order to reinforce sustainability criteria and reduce the risk of non-sustainable energy production with further negative impact on land-use and biodiversity[50]. The advancement and dissemination of renewable and innovative energy technologies should be supported with specific financial aid for the production of renewable fuels of non-biological origin (RFNBOs)[51].

Directive 2003/96/EC of 27 October 2003 on the taxation of energy products and electricity ("Energy Taxation Directive" or "ETD") which is in force, offers the opportunity to the Member States to promote clean technologies by introducing higher levels of taxation for unsustainable fuels.

However, the ETD Directive at present fails to incentivize adequately the transition to a low-carbon economy as it lacks sufficient support for climate action. A wide range of tax exemptions and reductions on fossil fuels are applied which do not actively work to decrease reliance on fossil fuels[52].

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[46] See comment about decision of T.A.R. Roma, sec. III, 20 novembre 2018, n. 11206, by C. DE STEFANO, *Spalma Incentivi, aiuti di Stato e legittimo affidamento: una riflessione sugli arbitrati internazionali d'investimento sulle energie rinnovabili*, in *Rivista del Commercio Internazionale*, Volume 33, n. 2, 2019, 403-416.

[47] Ministerial Decree Biofuels n. 107/2023, of 16th March 2023, entered into force on 14th April 2023.

[48] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652.

[49] RED III has increased the target of the share to 5,5 % from 3,5% in the energy supplied to the transport sector to 5,5 % in 2030.

[50] Biofuels production in Europe has been increased to 39% in 2021 compared to 2013. Biodiesel represents almost the 80% of the consumption, in the second place there is bioethanol (18%) whereas biomethane with other biofuels liquid only 1%. For extensive reading see: A. SAVARESI, L. PERUGINI, op. cit.; H. K. JESWANI H. K., op. cit.; A. SWINBANK, op. cit.

[51] Article 2 of Directive RED III has been amended to include the definition of "renewable fuels" as biofuels, bioliquids, biomass fuels and renewable fuels of non-biological origin whilst "renewable fuels of non-biological origin" as liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass.

[52] S. MORATTI, *Green Deall Europeo: nuove prospettive per ala fiscalità dell'energia nelle politiche di gestione dei rischi climatici*, in *Rivista di Diritto Finanziario e Scienza delle Finanze*, fasc. 4, 2020, 439; M. COSSU, *Sostenibilità e mercati:*

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The assessed disadvantages of the ETD Directive were thoroughly analysed in 2019 and brought into a new proposal for a Council Directive[53] in 2021 aiming to reform the Union legislative framework for the taxation of energy products and electricity. The new proposal would contribute to the reduction of fossil fuels by setting higher rates for unsustainable fuels and lower rates for renewables ones, discouraging in that way the use of fossil fuels by Member States accordingly to EU's climate neutrality objectives.

To accelerate the adoption, and promote the uptake of sustainable fuels in the air transport and maritime sector[54], the Revision of the Energy Taxation Directive announces that conventional fossil fuels, such as gas oil and petrol will be taxed at the highest rate[55]. Instead for a transitional period of ten years two-thirds (2/3) of the reference rate will apply to fuels that are fossil based but are less harmful and still have some potential to contribute to decarbonisation in the short and medium term such as natural gas, LPG and hydrogen of fossil origin[56]. Thereafter this rate will increase to the full reference rate. Also, for the same duration of a transitional period, half (½) of the reference rate will apply to sustainable but not advanced biofuels whilst the lowest rate will apply to electricity[57], regardless of its use, advanced biofuels, bioliquids, biogases and hydrogen of renewable origin.

la sostenibilità ambientale dell'impresa dai mercati reali ai mercati finanziari, in *Banca Borsa Titoli di Credito*, Volume 76, n. 4, 2023, 558.

[53] Proposal COM (2021) 563 for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast), 14.7.202, COM (2021) 563 final, 2021/0213(CNS).

[54] In the maritime sector the revision of the Energy Taxation Directive together with Regulation (EU) 2023/1805 (FuelEU Maritime) announces a key measure under which fossil fuels used as fuel for intra-EU maritime transport and fishing should no longer be fully exempt from energy taxation in the EU. This measure is highly important in terms of climate friendly policies considering the pollution produced from the energy consumption of these sectors. This will facilitate the transition away from fossil fuels towards cleaner energy to deliver on the EU's climate neutrality objectives.

[55] According to the updated ETD, conventional fossil fuels, such as gas oil and petrol, and non-sustainable biofuels will be subject to the highest minimum rate of €10.75 per gigajoule when used as a motor fuel and €0.9 per gigajoule when used for heating. This rate also serves as a reference rate for the other categories.

[56] On the topic see also: H. SCHEUING, J. KAMM, op. cit.; J. WELLER, op. cit.; A. METAXAS, op. cit.

[57] A. METAXAS, op. cit.

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